



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,837	12/03/2003	Gapgoung Kong	10982.0007.NPUS00	5540
	7590 12/16/2004		FPCU:00	
Patricia A. Kammerer Howrey Simon Arnold & White, LLP 750 Bering Drive Houston, TX 77057-2198			EXAMINER BROWN, JENNINE M	
			ART UNIT	PAPER NUMBER
			1755	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,837

Applicant(s)

KONG ET AL.

Examiner

Jennine M. Brown

Art Unit

1755

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/3/03
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 16 are indefinite because the meaning of "R₃M" is unclear. It is common practice to use subscripts to define multiples of a ligand "R" and superscripts to define each ligand uniquely (e.g. R¹, R², R³). Dependent claims 2 and 17 further limit "R₃" as a C₁₋₁₃ hydrocarbon. Based on the Markush group in dependent claims 3 and 18, Examiner assumes that "R" should be defined as a C₁₋₁₃ hydrocarbon and not "R₃" because each "R" is the same and there are three of them.

Claims 10 and 25 fail to distinguish "R" from that defined in claim 1. These R groups are defined as "alkyl" but are not distinguishable by a superscript and therefore should be modified to properly reflect that they are different. Furthermore "O" is also undefined. Examiner assumes "O" is oxygen for purposes of furthering prosecution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5, 8-20, 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen, et al. (US 6271165 B1) in view of Ward (US 6403518 B2).

Jacobsen, et al. disclose both supported and non-supported catalyst system comprising (a) alkyl aluminum, alkyl boron, alkyl gallium or alkyl indium (C₁₋₁₃ – col. 9, l. 21 – col. 11, l. 48; col. 22, l. 40–col. 23, l. 33) with an ammonium having an N-H bond (col. 11, l. 49 – col. 13, l. 27), (b) dialkyl magnesium (col. 22, l. 38-56), (c) cyclic diene (col. 14, l. 46-62) and early transition metal (col. 15, l. 11 – col. 21, l. 55).

Support materials can be polymeric or inorganic oxides (abstract; col. 8, l. 21-33; col. 23, l. 34–col. 25, l. 4). Hydrocarbon solvent (col. 25, l. 49-56) and triethylaluminum co-catalyst are also disclosed (col. 45, l. 54-65). Jacobsen, et al. disclose a method of copolymerization of alpha olefin by contacting said alpha olefin (dienes) with the catalyst (col. 26, l. 58 – col. 38, l. 13; see esp. col. 30, l. 40-67).

Jacobsen, et al. do not specifically disclose and trialkyl aluminum, trialkyl boron, trialkyl gallium or trialkyl indium where all three alkyl ligands are identical reacted with

an amine with an N-H bond. Jacobsen, et al. do not specifically disclose a halogenated magnesium support. Jacobsen, et al. do not specifically disclose the use of traditional Ziegler Natta catalysts rather than metallocene catalysts.

Ward discloses trialkyl aluminum and boron where the ligands are each the same (col. 5, l. 38-52) and the non ionic form of the complex (col. 3, l. 7-13) using amines such as methylamine, aniline, dimethylamine, diethylamine, diphenylamine, pyridine (col. 5, l. 14-28). Ward discloses inorganic oxide carriers, magnesium chloride carrier and polymeric carriers (col. 3, l. 50-col. 4, l. 6). Ward discloses the use of both metallocene (col. 6, l. 1 – col. 8, l. 27) and Ziegler Natta catalysts, specifically VCl_4 , $VOCl_3$, and other titanium and zirconium compounds (col. 8, l. 28-56). Ward also discloses that alpha olefin polymerization techniques by solution, slurry and gas phase are well known in the art (col. 11, l. 14-col. 12, l. 4).

It would have been obvious to one of ordinary skill in the art to modify the catalyst of Jacobsen, et al. with that of Ward, which would substitute the ionic compound of Jacobsen, et al. for the non ionic compound of Ward where the amine coordinates with the Lewis Acid because an ionic solvent would no longer be necessary to provide soluble catalytic components in favor of more commonly used hydrocarbon solvents. Furthermore, it would have been obvious to one of ordinary skill in the art to substitute the magnesium chloride of Ward for the magnesium oxide of Jacobsen, et al. because the magnesium chloride is more reactive towards the ligand and would provide a better bonding surface for said ligand to attach to the support surface. It would have


been obvious to one of ordinary skill in the art to substitute the metallocene catalyst components for that of Ward's Ziegler Natta catalyst components because it is easier to bind a Ziegler Natta catalyst to an inorganic support than a metallocene.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennine M. Brown whose telephone number is (571) 272-1364. The examiner can normally be reached on M-F 8:00 AM - 6:00 PM; first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell can be reached on (571) 272-1362. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jmb


DAVID SAMPLE
PRIMARY EXAMINER